Interrupts

What is an Interrupt?

- Reaction to something in I/O
- Asynchronous in nature
- Invokes Interrupt handler, or ISR

program flow

- Main Program
  - Instruction 1
  - Instruction 2
  - Instruction 3
  - Instruction 4
  - …..
- ISR
  - Save state
  - Instruction 1
  - Instruction 2
  - Instruction 3
  - …..
  - Restore state
  - Return from Interrupt

Saving and Restoring the context

- Processor and compiler dependant
- Must ensure that registers are saved
- Must save return vector
- Must restore state

Disabling Interrupts

- Disable instruction
- Priority interrupts
  - Higher priority can interrupt
  - Lower priority can't
- Non-maskable interrupts
- Does the AVR have Priority or non-maskable interrupts?

Questions about Interrupts

- How does the processor find the ISR?
- How does it know where the table is?
- Can an ISR be interrupted in the middle of an instruction?

More Questions

- If interrupts happen at the same time, which ISR does the processor execute?
- Can one interrupt request signal interrupt another interrupt routine?

Disabling Questions…

- What happens to interrupts that occur while interrupts are disabled?
- What if I disable interrupts and forget to re-enable them?
- Can I disable or enable them twice?
- What about start-up?